

AMENDMENT TO CLAIMS

1.-14. (Canceled)

1 ~~15~~ (New) A method of reducing phosphate ore losses in a desliming process comprising:

directing a phosphate ore feed preparation slurry to a desliming unit;

adding a sufficient amount of:

one or more surfactants, wherein the one or more surfactants are anionics selected from the group consisting of salts of mono and divalent ions of general formula $R-X(m)$ wherein R is C_6-C_{16} alkyl, alkylene, aryl, alkyl aryl, naphthalene, or substituted naphthalene, and X is sulfonic acid, sulfuric acid, phosphoric acid, or carboxylic acid, and m is 1 to 5,

or

one or more organic polymers selected from the group consisting of synthetic polymers, semisynthetic polymers, natural polymers and any combination of said polymers,

or

a combination of said one or more surfactants and said one or more organic polymers,
to the phosphate ore feed preparation slurry;

mixing said

one or more surfactants,

one or more organic polymers, or

said combination of said one or more surfactants and one or more organic polymers,

so as to reduce a viscosity of the phosphate ore feed preparation slurry and

wherein fine phosphate ore particles are made to settle for recovery;

collecting said fine phosphate ore particles which have settled out from the phosphate ore feed preparation slurry for directing to a beneficiation process for recovering a phosphate ore product; and

directing said collected fine phosphate ore particles along with coarser fractions to the beneficiation process for recovering the phosphate ore product.

2 ~~16~~. (New) The method according to Claim ~~15~~, wherein when the combination of the one or more surfactants and one or more organic polymers is added to the phosphate ore feed preparation slurry, the one or more surfactants are added prior to the addition of the one or more organic polymers.

3 ~~17~~. (New) The method according to Claim ~~15~~, wherein when the combination of the one or more surfactants and one or more organic polymers is added to the phosphate ore feed preparation slurry, the one or more organic polymers are added prior to the addition of the one or more surfactant.

4 ~~18~~. (New) The method according to Claim ~~15~~, wherein when the combination of the one or more surfactants and one or more organic polymers is added to the phosphate ore

preparation slurry, the one or more surfactants and the one or more organic polymers are added to the phosphate ore preparation slurry simultaneously.

5 19. (New) The method according to Claim 18, wherein the polymers are selected from the group consisting of formaldehyde products, cellulose products, gelatin products, starch products, acrylamides, and acrylates.

6 20. (New) The method according to Claim 18, wherein the desliming unit comprises one of large tanks, settling tanks, sand traps, hydrocyclones, classifiers, thickeners, and ground containment areas.

7 21. (New) A method of reducing phosphate ore losses in a desliming process comprising:

adding a sufficient amount of:

one or more surfactants, wherein the one or more surfactants are anionics selected from the group consisting of salts of mono and divalent ions of general formula $R-X(m)$ wherein R is C_6-C_{16} alkyl, alkylene, aryl, alkyl aryl, naphthalene, or substituted naphthalene, and X is sulfonic acid, sulfuric acid, phosphoric acid, or carboxylic acid, and m is 1 to 5,

or

one or more organic polymers selected from the group consisting of synthetic polymers, semisynthetic polymers, natural polymers and any combination of said polymers,

or

a combination of said surfactants and organic polymers
to a phosphate ore feed preparation slurry in a desliming unit;
mixing said

one or more surfactants,

one or more organic polymers, or

said combination of said one or more surfactants and one or more organic
polymers,

so as to reduce the viscosity of the phosphate ore preparation slurry and
wherein fine phosphate ore particles are made to settle and are collected for
recovery.

8 22. (New) The method according to Claim 21, wherein when the combination of the
one or more surfactants and one or more organic polymers is added to the phosphate ore
preparation slurry, the surfactant is added prior to the addition of the one or more organic
polymers.

9 23. (New) The method according to Claim 21, wherein when the combination of the
one or more surfactants and one or more organic polymers is added to the phosphate ore feed
preparation slurry, the one or more organic polymers are added prior to the addition of the one or
more surfactants.

10 ~~24~~⁷. (New) The method according to Claim ~~21~~⁷, wherein when the combination of the one or more surfactants and the one or more organic polymers is added to the phosphate ore feed preparation slurry, the one or more surfactants and the one or more organic polymers are added to the phosphate ore feed preparation slurry simultaneously.

11 ~~25~~⁷. (New) The method according to Claim ~~21~~⁷, wherein the polymers are selected from the group consisting of formaldehyde products, cellulose products, gelatin products, starch products, acrylamides, and acrylates.

12 ~~26~~⁷. (New) The method according to Claim ~~21~~⁷, wherein the desliming unit comprises one of large tanks, settling tanks, sand traps, hydrocyclones, classifiers, thickeners, and ground containment areas.

13 ~~27~~. (New) A method of reducing phosphate ore losses in a desliming process comprising:

directing a phosphate ore feed preparation slurry to a desliming unit;

adding a sufficient amount of:

one or more surfactants, or

one or more organic polymers, or

a combination of said one or more surfactants and said one or more organic polymers,

to the phosphate ore feed preparation slurry;

mixing said:

one or more surfactants, or

one or more organic polymers, or

said combination of said one or more surfactants and one or more organic polymers,

so as to reduce a viscosity of the phosphate ore feed preparation slurry and

wherein fine phosphate ore particles are made to settle for recovery;

collecting said fine phosphate ore particles which have settled out from the phosphate ore feed preparation slurry for directing to a beneficiation process for recovering a phosphate ore product; and

directing said collected fine phosphate ore particles along with coarser fractions to the beneficiation process for recovering the phosphate ore product,

wherein when the combination of the one or more surfactants and one or more organic polymers is added to the phosphate ore feed preparation slurry, the one or more surfactants are added prior to the addition of the one or more organic polymers.

 ~~14~~ ¹³ 28. (New) The method according to Claim ~~27~~,¹³

wherein the one or more surfactants are anionics selected from the group consisting of salts of mono and divalent ions of general formula $R-X(m)$ wherein R is C_6 - C_{16} alkyl, alkylene, aryl, alkyl aryl, naphthalene, or substituted naphthalene, and X is sulfonic acid, sulfuric acid, phosphoric acid, or carboxylic acid, and m is 1 to 5, and

wherein the one or more organic polymers are selected from the group consisting of synthetic polymers, semisynthetic polymers, natural polymers and any combination of said polymers.

15 ~~29~~¹⁴. (New) The method according to Claim ~~28~~¹⁴, wherein the polymers are selected from the group consisting of formaldehyde products, cellulose products, gelatin products, starch products, acrylamides, and acrylates.

16 ~~30~~¹³. (New) The method according to Claim ~~27~~¹³, wherein the desliming unit comprises one of large tanks, settling tanks, sand traps, hydrocyclones, classifiers, thickeners, and ground containment areas.

17 ~~31~~. (New) A method of reducing phosphate ore losses in a desliming process comprising:

directing a phosphate ore feed preparation slurry to a desliming unit;

adding a sufficient amount of:

one or more surfactants, or

one or more organic polymers, or

a combination of said one or more surfactants and said one or more organic polymers,

to the phosphate ore feed preparation slurry;

mixing said:

one or more surfactants, or


one or more organic polymers, or

said combination of said one or more surfactants and one or more organic polymers,

so as to reduce a viscosity of the phosphate ore feed preparation slurry and
wherein fine phosphate ore particles are made to settle for recovery;
collecting said fine phosphate ore particles which have settled out from the
phosphate ore feed preparation slurry; and

directing said collected fine phosphate ore particles along with coarser fractions to
a beneficiation process for recovering a phosphate ore product,

wherein when the combination of the one or more surfactants and one or more
organic polymers is added to the phosphate ore feed preparation slurry, the one or more organic
polymers are added prior to the addition of the one or more surfactant.


¹⁸
~~32~~. (New) The method according to Claim ¹⁷~~31~~,

wherein the one or more surfactants are anionics selected from the group consisting of
salts of mono and divalent ions of general formula $R-X(m)$ wherein R is C_6-C_{16} alkyl, alkylene,
aryl, alkyl aryl, naphthalene, or substituted naphthalene, and X is sulfonic acid, sulfuric acid,
phosphoric acid, or carboxylic acid, and m is 1 to 5, and

wherein the one or more organic polymers are selected from the group consisting of
synthetic polymers, semisynthetic polymers, natural polymers and any combination of said
polymers.

¹⁹
~~33~~. (New) The method according to Claim ¹⁸~~32~~, wherein the polymers are selected from

the group consisting of formaldehyde products, cellulose products, gelatin products, starch
products, acrylamides, and acrylates.

²⁰
~~34~~ (New) The method according to Claim ¹⁷~~31~~, wherein the desliming unit comprises one of large tanks, settling tanks, sand traps, hydrocyclones, classifiers, thickeners, and ground containment areas.

²¹ ~~35~~. (New) A method of reducing phosphate ore losses in a desliming process comprising:

directing a phosphate ore feed preparation slurry to a desliming unit;

adding a sufficient amount of:

one or more surfactants, or

one or more organic polymers, or

a combination of said one or more surfactants and said one or more organic polymers,

to the phosphate ore feed preparation slurry;

mixing said:

one or more surfactants, or

one or more organic polymers, or

said combination of said one or more surfactants and one or more organic polymers,

so as to reduce a viscosity of the phosphate ore feed preparation slurry and


wherein fine phosphate ore particles are made to settle for recovery;

collecting said fine phosphate ore particles which have settled out from the

phosphate ore feed preparation slurry; and

directing said collected fine phosphate ore particles along with coarser fractions to a beneficiation process for recovering a phosphate ore product,

wherein when the combination of the one or more surfactants and one or more organic polymers is added to the phosphate ore preparation slurry, the one or more surfactants and the one or more organic polymers are added to the phosphate ore preparation slurry simultaneously.

 21 36. (New) The method according to Claim ~~35~~²¹,

wherein the one or more surfactants are anionics selected from the group consisting of salts of mono and divalent ions of general formula $R-X(m)$ wherein R is C_6-C_{16} alkyl, alkylene, aryl, alkyl aryl, naphthalene, or substituted naphthalene, and X is sulfonic acid, sulfuric acid, phosphoric acid, or carboxylic acid, and m is 1 to 5, and

wherein the one or more organic polymers are selected from the group consisting of synthetic polymers, semisynthetic polymers, natural polymers and any combination of said polymers.

23 37. (New) The method according to Claim ~~36~~²², wherein the polymers are selected from the group consisting of formaldehyde products, cellulose products, gelatin products, starch products, acrylamides, and acrylates.

24 38. (New) The method according to Claim ~~35~~²¹, wherein the desliming unit comprises one of large tanks, settling tanks, sand traps, hydrocyclones, classifiers, thickeners, and ground containment areas.

25 39 (New) A method of reducing phosphate ore losses in a desliming process comprising:

adding one of:

a sufficient amount of one or more surfactants, or

a sufficient amount of one or more organic polymers, or

a sufficient amount of a combination of said surfactants and organic polymers to a phosphate ore feed preparation slurry in a desliming unit;

mixing said one of the one or more surfactants, the one or more organic polymers

or the combination of said one or more surfactants and one or more organic polymers, so as to reduce the viscosity of the phosphate ore preparation slurry and wherein fine phosphate ore particles are made to settle and are collected for recovery,

wherein when the combination of the one or more surfactants and one or more organic polymers is added to the phosphate ore preparation slurry, the surfactant is added prior to the addition of the one or more organic polymers.

26 40 (New) The method according to Claim 25 39,

wherein the one or more surfactants are anionics selected from the group consisting of salts of mono and divalent ions of general formula $R-X(m)$ wherein R is C_6-C_{16} alkyl, alkylene, aryl, alkyl aryl, naphthalene, or substituted naphthalene, and X is sulfonic acid, sulfuric acid, phosphoric acid, or carboxylic acid, and m is 1 to 5, and

wherein the one or more organic polymers are selected from the group consisting of synthetic polymers, semisynthetic polymers, natural polymers and any combination of said polymers.

27 ~~41~~ (New) The method according to Claim ²⁶~~40~~, wherein the polymers are selected from the group consisting of formaldehyde products, cellulose products, gelatin products, starch products, acrylamides, and acrylates.

28 ~~42~~ (New) The method according to Claim ²⁵~~39~~, wherein the desliming unit comprises one of large tanks, settling tanks, sand traps, hydrocyclones, classifiers, thickeners, and ground containment areas.

29 ~~43~~ (New) A method of reducing phosphate ore losses in a desliming process comprising:

adding one of:

a sufficient amount of one or more surfactants, or

a sufficient amount of one or more organic polymers, or

a sufficient amount of a combination of said surfactants and organic

polymers to a phosphate ore feed preparation slurry in a desliming unit;

mixing said one of the one or more surfactants, the one or more organic polymers or the combination of said one or more surfactants and one or more organic polymers, so as to reduce the viscosity of the phosphate ore preparation slurry and wherein fine phosphate ore particles are made to settle and are collected for recovery,

wherein when the combination of the one or more surfactants and one or more organic polymers is added to the phosphate ore feed preparation slurry, the one or more organic polymers are added prior to the addition of the one or more surfactants.

³⁰
~~44~~ (New) The method according to Claim ²⁹~~43~~,

wherein the one or more surfactants are anionics selected from the group consisting of salts of mono and divalent ions of general formula $R-X(m)$ wherein R is C_6-C_{16} alkyl, alkylene, aryl, alkyl aryl, naphthalene, or substituted naphthalene, and X is sulfonic acid, sulfuric acid, phosphoric acid, or carboxylic acid, and m is 1 to 5, and

wherein the one or more organic polymers are selected from the group consisting of synthetic polymers, semisynthetic polymers, natural polymers and any combination of said polymers.

³¹
~~45~~ (New) The method according to Claim ³⁰~~44~~, wherein the polymers are selected from the group consisting of formaldehyde products, cellulose products, gelatin products, starch products, acrylamides, and acrylates.

³²
~~46~~ (New) The method according to Claim ³¹~~45~~, wherein the desliming unit comprises one of large tanks, settling tanks, sand traps, hydrocyclones, classifiers, thickeners, and ground containment areas.

³³
~~47~~ (New) A method of reducing phosphate ore losses in a desliming process comprising:

adding one of:

a sufficient amount of one or more surfactants, or

a sufficient amount of one or more organic polymers, or

a sufficient amount of a combination of said surfactants and organic polymers to a phosphate ore feed preparation slurry in a desliming unit; mixing said one of the one or more surfactants, the one or more organic polymers or the combination of said one or more surfactants and one or more organic polymers, so as to reduce the viscosity of the phosphate ore preparation slurry and wherein fine phosphate ore particles are made to settle and are collected for recovery,

wherein when the combination of the one or more surfactants and the one or more organic polymers is added to the phosphate ore feed preparation slurry, the one or more surfactants and the one or more organic polymers are added to the phosphate ore feed preparation slurry simultaneously.

34
48. (New) The method according to Claim 33,

wherein the one or more surfactants are anionics selected from the group consisting of salts of mono and divalent ions of general formula $R-X(m)$ wherein R is C_6-C_{16} alkyl, alkylene, aryl, alkyl aryl, naphthalene, or substituted naphthalene, and X is sulfonic acid, sulfuric acid, phosphoric acid, or carboxylic acid, and m is 1 to 5, and

wherein the one or more organic polymers are selected from the group consisting of synthetic polymers, semisynthetic polymers, natural polymers and any combination of said polymers.

35
49. (New) The method according to Claim 34, wherein the polymers are selected from the group consisting of formaldehyde products, cellulose products, gelatin products, starch products, acrylamides, and acrylates.

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(New) The method according to Claim ~~47~~³⁸, wherein the desliming unit comprises

one of large tanks, settling tanks, sand traps, hydrocyclones, classifiers, thickeners, and ground containment areas.
